



Title	BLOW FLIES OF MEDICAL IMPORTANCE IN NEW GUINEA, BISMARCK ARCHIPELAGO AND BOUGAINVILLE ISLAND (DIPTERA : CALLIPHORIDAE) PART I. GENERA CALLIPHORA, TAINANINA, POLLENIOPSIS AND MELINDA
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BLOW FLIES OF MEDICAL IMPORTANCE IN NEW GUINEA, BISMARCK  
ARCHIPELAGO AND BOUGAINVILLE ISLAND  
(DIPTERA : CALLIPHORIDAE) PART I. GENERA **CALLIPHORA**,  
**TAINANINA**, **POLLENIOPSIS** AND **MELINDA**"

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### Abstract

One hundred twelve species (including 23 new species and 5 unrecorded species) of the genera **Calliphora**, **Tainanina**, **Onesia**, **Polleniopsis**, **Melinda**, **Hemipyrellia**, **Lucilia**, **Phumosia**, **Euphumosia**, *Dexopollenia*, *Bengalia*, *Chrysomya*, **Rhinia**, *Chlororhinia*, *Stomorrhina*, *Idiella*, **Metalea**, *Platytropesa*, **Stilbomyella** and *Paramenia* are recognized from New Guinea, Bismarck Archipelago and Bougainville Island as a result of field works supported by Grants-in-Aid for Overseas Scientific Survey from the Japan Ministry of Education, Science and Culture since 1973.

This paper, as the first one of my report, deals with **Calliphora**, **Tainanina**, **Polleniopsis** and **Melinda** and presents a key to all the 20 genera mentioned above. Three new species, **Calliphora** (*Paracalliphora*) *kanoi*, **Melinda** *ruficornis* and **Melinda** *flavipennis* are described.

### Introduction

The calliphorid flies collected during expeditions to Papua New Guinea and the South Pacific Islands (Tokyo Medical and Dental University Overseas Scientific Research Project, 1973, 1975, & 1977 ; Kyushu University Overseas Scientific Research Project, 1982 & 1984) were studied. I also had an opportunity to examine some specimens on loan from Bishop Museum, Honolulu (Bishop) ; British Museum (Nat. Hist.), London (BMNH) ; Department of Primary Industry, Konedobu, PNG (DPI) ; and Forest Research Station, Bulolo, PNG (FRS). These specimens enabled me to study the Calliphoridae from New Guinea, the Bismarck Archipelago and Bougainville Island,

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and to summarize the calliphorid fauna of the area for the first time. A total of 112 species, including the previously recorded ones, are represented in the fauna. Twenty-three of these species are new to science and 5 are recorded for the first time from the area.

Among the previous works, the following two and some others (Theowald 1957, 1959) are very useful to study the blow flies of New Guinea and its adjacent islands. An excellent revision on the Ameniine Calliphoridae (Crosskey 1969) reported 7 species from New Guinea and the Bismarck Archipelago. Torgerson and James (1967) also published an encouraging paper on the genus *Euphumosia* and listed 32 species endemic in New Guinea, Ambon, Ceram and Northern Territory of Australia. James (1971 a, b) and Kurahashi (1971, 1972, 1978, 1980, 1984) described or redescribed the chrysomyine and calliphorine blow flies from New Guinea and the Bismarck Archipelago.

The blow fly fauna in New Guinea and its adjacent islands is characterized by the dominance of endemic forms (77 spp., 69 %). The genus *Euphumosia* is certainly peculiar to this area and consists of 35 New Guinea species. The genus *Onesia* also contains 11 endemic species. Seven species of the New Guinea Ameniinae have never been recorded from other than New Guinea. One or a few endemic species are found in each of the following genera : *Calliphora*, *Polleniopsis*, *Melinda*, *Lucilia*, *Hemipyrellia*, *Phumosia*, *Dexopollenia*, *Bengalia*, *Chrysomya*, *Stomorkhina*, *Idiella* and *Metalea*. The Indo-Australian (21 spp., 19 %) and Australian (12 spp., 10 %) make up about 30 % of the total blow fly fauna in New Guinea and its adjacent islands. *Lucilia cuprina* (Wiedemann) and *Rhinia apicalis* (Wiedemann) are known to be pan-tropical (1%). *Hemipyrellia ligurriens* (Wiedemann) widely distributed in the Indo-Australian area and partly invading the Palaearctic Asia such as China, Korea and Japan. *Chrysomya megacephala* (Fabricius) and *Ch. bezziana* Villeneuve are certainly common in the Indo-Australian area, but the former was recently introduced into the Afrotropical and Neotropical Regions. These two flies are well known to be harmful and filth pests and they are so called "the Oriental Latrine Fly" and "the Old World Screw Worm Fly", respectively.

#### BLOW FLIES OF MEDICAL IMPORTANCE

The blow flies are considered as one of groups of medical importance. Some species have been known as myiasis producers and their larvae normally developed in carcasses, sometimes become facultative parasites in traumatic lesions. *Chrysomya bezziana*, the Old World Screwworm Fly, is an obligatory parasite which causes traumatic myiasis of man and domestic animals. New Guinea is a screwworm-ridden country. Maggots of this species infest all parts of soft and mucous tissues of human beings such as the nose, mouth, ear, axilla, orbits and the genital organs of male and female. Such domestic animals as cattle, carabao, goat, horse and sheep are also attacked by this screwworm and develop skin wounds and injured parts of the body resulting from faulty dehorning.

Another species called the Oriental Latrine Fly, *Chrysomya megacephala*, which is

closely related to *Ch. bezziana*, is a feces and carrion breeder and very common around human dwellings and frequent foods in markets. The omnivorous and promiscuous feeding habits enable these flies to be potential vectors of a number of diseases of man and animals. Pathogenic organisms and other helminthic parasites are mechanically transferred from an infected source to human food through the appendages, body hairs or bristles of blow flies which feed or congregate on infected filth, such as human excrement and sewage, and through vomit drop or regurgitation habits and fecal droppings. They may thus become of considerable importance during epidemics of intestinal diseases such as typhoid, cholera and amoebiasis. The origin and establishment of the synanthropy of *Ch. megacephala* has been studied in Wau Ecological Institute, Papua New Guinea (Kurahashi 1982b, 1984) and the details will be discussed further in separate papers, including the ecological observations made on the last survey trip.

## KEY TO THE GENERA OF NEW GUINEA CALLIPHORIDAE

1. Stem vein setulose above ..... 16
- Stem vein bare ..... 2
2. Anterior lappet of metathoracic spiracle with a conspicuous backwardly-directed tuft of long hairs ; postscutellum forming a definite convex swelling which is microrugose and shows slight trace of shallow median incision ..... subfamily AMENIINAE ..... 3
- Anterior lappet of metathoracic spiracle bare or at most with a very few small inconspicuous hairs ; postscutellar region not at all convex or at most with rudimentary trace of swelling, not as above ..... subfamily CALLIPHORINAE ..... 5
3. Head with a very strong facial carina separating antennae ; hind tibia with apical *pv* ; outer *ph* situated mesad of *prs* ..... tribe Ameniini ..... 4
- Head without a facial carina ; hind tibia without definite apical *pv* ; outer *ph* situated laterad of *prs* ..... tribe Parameniini, genus ***Paramenia***
4. Fore tibia with 2-3 small but distinct *pd* ; facialia with fine setulae extending more than 1/2 or about 1/2 way up their length, in profile reaching far beyond level of apex of antennae ..... genus *Platytropesa*
- Fore tibia without *pd* ; fine hairs above vibrissae confined to lower 1/4 of facialia, in profile only extending at most a little beyond apex of antennae ..... genus *Stilbomyella*
5. Propleura hairy ..... 6
- Propleura bare ..... 15
6. Thoracic squama more or less hairy on upper surface ..... tribe Calliphorini
- Thoracic squama quite bare on upper surface ..... 7
7. Posterior part of suprasquamal ridge with a tuft of black setulose erect hairs on a small well-defined black sclerite (posterior parasquamal tuft) ..... tribe Luciliini
- Posterior parasquamal tuft absent ..... 8
8. Anterior part of suprasquamal ridge bare ; distance between right and left of presutural **ac** rather large, as shown in Fig. 1a ; mesothoracic spiracle rather large, remarkably swollen ..... tribe Phumosiini ..... 9
- Anterior parasquamal tuft present, if not so, a distance between right and left of presutural **ac** small as shown in Fig. 1b ; mesothoracic spiracle smaller, not swollen ..... tribe Calliphorini ..... 11
9. Supraspiracular convexity clothed with long, upstanding, fine hairs ..... genus *Phumosia*
- Supraspiracular convexity bare or pubescent ..... genus *Euphumosia*

10. Supraspiracular convexity clothed with long, upstanding, fine hairs ..... genus *Hemipyrellia*  
 - Supraspiracular convexity bare or pubescent ..... genus *Lucilia*
11. Presutural *ac* usually 1, rarely absent ; facial carina distinctly developed ... genus *Polleniopsis*  
 - Presutural *ac* 2, sometimes 3 ; facial carina absent ..... 12  
 - Presutural *ac* 1-2, anterior one usually fine, sometimes absent ; eyes covered with hairs ; epistome remarkably projecting ; facial carina absent ; *ac*1-2+2 .....  
 ..... subgenus *Calliphora* (*Papuacalliphora*)
12. Thoracic squama quite bare on dorsal surface ; anterior parasquamal tuft developed .....  
 ..... genus *Melinda*  
 - Thoracic squama more or less hairy on dorsal surface, if not so, anterior parasquamal portion bare ..... 13
13. Male frons very broad ; eyes dichoptic in ♂ and ♀ ; 3rd antennal segment elongate, more than 4 times as long as 2nd ; presutural *ia* absent ..... genus *Tainanina*  
 - Eyes holoptic in ♂ and dichoptic in ♀ ; length of 3rd antennal segment variable ; presutural *ia* present or absent ..... 14
14. Genae bright orange to yellow in ground colour, more or less yellowish-dusted ; distance between right and left of presutural *ac* rather large, as shown in Fig. 1a ; body rather large ..... subgenus *Calliphora* (*Paracalliphora*)  
 - Genae fuscous in ground colour, as a rule, densely gray or yellowish-gray dusted ; distance between right and left of presutural *ac* small as shown in Fig. 1b ; body usually small to medium in size, sometimes rather large ..... genus *Onesia*
15. Prosternum hairy ..... tribe Bengaliini, genus *Bengalia*  
 - Prosternum bare ..... tribe Polleniini, genus *Dexopollenia*
16. Thoracic squama with hairs on upper surface ; subcostal sclerite setulose ; pre-alar knob usually setulose (if bare, then metallic blue and yellow flies as in *Eucompsomyia* Malloch) ..... subfamily CHRY SOMY INAE, genus *Chrysomya*  
 - Thoracic squama bare above ; subcostal sclerite with fine pubescence ; pre-alar knob bare ..... subfamily RHINIINAE ..... 17
17. Arista pectinate ; *ac* and *dc* not distinguishable from the general ground hairs, the prescutellars at most weakly developed ; suprasquamal ridge bare ..... tribe Rhiniini ..... 18  
 - Arista pubescent or plumose, not pectinate ..... tribe Cosmiini ..... 21
18. Outer *ph* absent ..... genus *Chlororhinia*  
 - Outer *ph* present ..... 19
19. Hind tibia without a conspicuous row of *ad*, but with 2-3 *ad* as long as or longer than the tibial diameter ; *R*<sub>5</sub> open ; body slender, parallel-sided ; abdomen mostly testaceous ..... genus *Idiella*  
 - Hind tibia with a conspicuous row of subequal *ad*, longer than the normal ground hairs, sometimes 2-3 rather strong *ad* developed among them ; front tibia with 1 *pv* ; body rather stout with ovate abdomen and usually of a dark colouration ..... 20
20. *R*<sub>5</sub> petiolate ; sternopleura glossy, without dusting ; mesopleura without setigerous spots ; mesopleural row of bristles incomplete ; legs entirely yellow ; tergite 1+2 with rather long marginal bristles in ♂ ..... genus *Rhinia*  
 - *R*<sub>5</sub> open in the wing margin or closed ; if petiolate then the sternopleura are heavily dusted ..... genus *Stomorphina*
21. Arista almost bare, only microscopically haired ; propleura hairy ..... genus *Metallea*  
 - Arista long-plumose ; propleura bare ; no record from Australian Region ..... genus *Isomyia*

### Genus *Calliphora* Rob.-Desvoidy

*Calliphora* Rob.-Desvoidy, 1830. Essai Myod. : 433. Type-species : *Musca vomitoria* Linné, 1758.

BLOW FLIES OF NEW GUINEA AND ADJACENT ISLANDS

Subgenus **Papuocalliphora** Kurahashi

*Papuocalliphora* Kurahashi, 1971. Pac. Insects 13 : 167. Type-species : *Calliphora toxopeusi* Theowald, 1957.

**Calliphora (Papuocalliphora) toxopeusi** Theowald

*Calliphora toxopeusi* Theowald, 1957. Nova Guinea, new ser. 8 : 158.

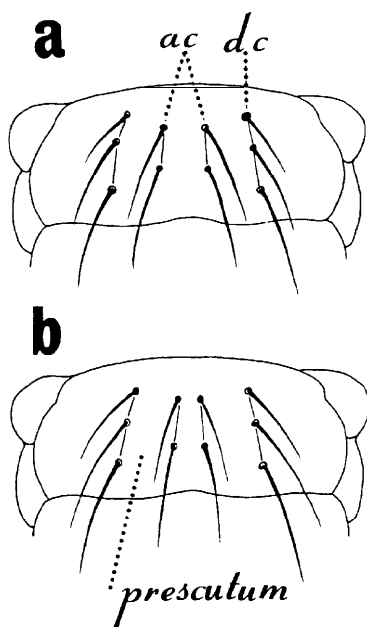
*Calliphora (Papuocalliphora) toxopeusi* : Kurahashi, 1971. Pac. Insects 13 : 167.

Length : 7.5-11.0 mm.

SPECIMENS EXAMINED. NEW GUINEA (PNG) : 3♂ 39 ♀, Mt. Hagen, 2,910 m, 12. II. 1978, Kano (TMDU) ; 2 ♀ 35 ♀, Mt. Kaindi, Wau, 10-13. I. 1974, 29. I. 1985, Shinonaga & Kurahashi (TMDU & KU) ; 9 ♀, Daulo Pass, 2,467 m, nr Goroka, 1. II. 1978, Kano (TMDU) ; 2 ♀, Mt. Ialibu-Mt. Giluwe, 2,000 m, 2. II. 1978, Kano (TMDU) ; 3 ♀, Margarima Farm, S. Highland, 2,000 m, 5. II. 1978, Kano (TMDU) ; 1 ♀, Wak River, Margarima, 2,100 m, 5. II. 1978, Kano (TMDU) ; 13 ♀, Tari Gap, 2,500 m, 3. II. 1978, Kano (TMDU) ; 10 ♀, Mt. Wilhelm, 3,600 m, Chimbu Dist., 1. VIII. 1982, Ismay (DPI) ; 1 ♀, Alpinegrass Country, Mt. Strong, Central Dist., 11,700 ft, 30. VIII. 1963, ? (DPI) ; 1 ♀, Mt. Scratchley, 11,000 ft, Central Dist., 7-11. VI. 1971, Wilkins (DPI). BOUGAINVILLE I. : 1 ♀, Mt. Balbi, 2,000-2,400 m, 1-7. III. 1968, Straatman (Bishop).

BIONOMICS. Larviparous. Adults are found in highlands above 2,000 m alt.

DISTRIBUTION. New Guinea (PNG) and Bougainville I.



**Fig. 1.** Prescutal chaetotaxy : a, *Calliphora*-type ; b, *Onesia*-type.

Subgenus **Paracalliphora** Townsend

**Paracalliphora** Townsend, 1916. Can. Ent. 48 : 151. Type-species : **Calliphora oceaniae** Rob.-Desvoidy, 1830.

KEY TO THE SPECIES OF *Paracalliphora*

1. Basicosta yellowish brown ; abdomen honey yellow on at least sides and venter, always with a large part of central section of disc metallic blue or violet coloured ..... *C. porphyrina* Kurahashi
- Basicosta black ; abdomen entirely metallic blue, sometimes blackish shining, without conspicuous dusting ..... 2
2. Front coxa with some yellow hairs on anterior surface at base; occipital dilatation behind genae usually yellowish orange ; face reddish brown ..... *C. papuensis* Kurahashi
- Front coxa black haired ; occipital dilatation just behind genae fuscous ; face submetallic, rarely reddish above epistome in ♂ ..... *C. kanoi* sp. nov.

**Calliphora (Paracalliphora) porphyrina** Kurahashi

**Calliphora (Paracalliphora) porphyrina** Kurahashi, 1971. Pac. Insects 13 : 181.

Length : 5.0-8.5 mm.

SPECIMENS EXAMINED. NEW GUINEA (PNG) : 2♀, Gumi, logging area, 6,000 ft, **13**. IX. 1984, Roberts (FRS) ; 13♂ 56♀, Mt. Kaindi, Wau, 26-29. XII. 1973, 5-17. I. 1974, 10-13. I. 1974, 29. I. 1985, Kano, Shinonaga, Shima & Kurahashi (TMDU & KU) ; 1♂, Mendi-Nipa, 2,200 m, 3. II. 1978, Kano (TMDU) ; 10♂ 5♀, Myola 2, Oro Prov., 20. IV-4. V. 1984, 2,080-2,200 m, Ismay (DPI) ; 1♂ 1♀, Mt. Manki, 1,500 m, Bulolo, Morobe Prov., 31. I. 1985, Kurahashi (KU) ; 3♀, Goroka town, 31. I. 1978, Kano (TMDU) ; 9♀, Mahkam River, nr Lae, 29. I. 1978, Kano (TMDU) ; 4♀, Zenag, 1,130 m to Gurokor, 800 m, 29. I. 1978, Kano (TMDU) ; 1♀, nr Nipa, 1,300 m, 3. II. 1978, Kano (TMDU) ; 1♀, Kaunan, 1,900 m, W. Highland, 13. II. 1978, Kano (TMDU).

BIONOMICS. Adults are attracted to decaying animal matter and human feces. Larviparous.

DISTRIBUTION. New Guinea (PNG).

**Calliphora (Paracalliphora) papuensis** Kurahashi

**Calliphora (Paracalliphora) papuensis** Kurahashi, 1971, Pac. Insects 13 : 171.

Length : 7.0-8.5 mm.

SPECIMENS EXAMINED. NEW GUINEA (PNG) : 1♂ 3♀, Gumi, logging area, 5,500-6,000ft, 11-13. IX. 1984, Roberts (FRS) ; 1♂, Myola, N. Prov., 2,200 ft, 2. XI. 1984, Roberts (FRS) ; 17♂ 1♀, Iora Creek, nr Myola 2, 2,080 m, 20. IV-3. V. 1984, Ismay (DPI) ; 2♂ 1♀, Daulo Pass, 2,400 m, 40 km W of Goroka, East H. Dist., 29-30. VII. 1982, Ismay (DPI) ; 1♂, Tambul, 2,200 m, West H. Dist., 12. VIII. 1982, Ismay (DPI) ; 1♂ 3♀, Mt. Kaindi, Morobe Prov., 14. IX. 1981, Ismay (DPI) ; 1♀, Sinsibai, 2,400 m, W. H. Prov., 6. V. 1984 (DPI) ; 1♀, Kakaitomba, 2,570 m, 26 km W of Mt. Hagen, W. H. Dist.,

10. VIII. 1982, Ismay (DPI) ; 1♂, Aiyura, 10. II. 1956, J. H. B. (DPI) ; 1♂, Daulo Pass, 8,175-8,300 ft, Bismarck Range, E. H. Dist., ? (DPI) ; 1♂ 2 ♀, Mt. Kaindi, 2,362 m, Wau, Morobe Prov., 29. I. 1985, Kurahashi (KU) ; 20 2 ♀, Tomba, ca 1,800 ft, 25 km W of Mt. Hagen, W. Highlands, 5. VI. 1965, Crosskey (BMNH) ; 1♂ 39, Wau, 2,500-4,000 ft, Morobe Dist., 14-23. V. 1965, Crosskey (BMNH) ; 1♂ 49, Daulo Pass, 8,175 ft, 25 km W of Goroka, 31. V. 1965, Crosskey (BMNH) ; 1♀, S side of Mt. Abilala, 8,000 ft, Finisterre Mts., Madang Dist., 17. XI. 1964, stn. No. 97 (BMNH) ; 1♀, Mt. Tafa, 8,500 ft, Papua, II. 1934, Cheesman (BMNH-1984-321) ; 39, Yemi Vill., Goilala, C. D. of Papua, 14. X. 1963, Smee, Ex. Coll. Dept. Agr. P. M. Nos. 5065, 5066, 5068 (BMNH) ; 190 6 252 ♀, Mt. Kaindi, Wau, 10-13. I 1974, 26-29. XII. 1974, Kano, Shinonaga & Shima (TMDU) ; 220 61 ♀, Mt. Ialibu-Mt. Giluwe, 2,000 m, 2. II. 1976, Kano (TMDU) ; 5 ♂ 15 ♀, Mendi to Mt. Hagen, 2,100 m, 11. II. 1976, Kano (TMDU) ; 6♂ 49, Tari Gap, 2,500 m, 3. II. 1978, Kano (TMDU) ; 5♂ 5♀, Mendi-Nipa, 2,200 m, 3. II. 1978, Kano (TMDU) ; 13♂ 129, Margarima Farm, S. Highland, 2,000 m, 5. II. 1978, Kano (TMDU) ; 30 5♀, Daulo Pass, 2,467 m, nr Goroka, 1. II. 1978, Kano (TMDU) ; 30 5 ♀, Wak River, Margarima, 2,100 m, 5. II. 1978, Kano (TMDU) ; 1♂ 8♀, nr Margarima, 2,000 m, 3. II. 1978, Kano (TMDU) ; 79, Mt. Hagen, 2,910 m, 12. II. 1978, Kano (TMDU) ; 7 ♀, Kaunan, 1,900 m, Mt. Hagen, W. Highland, 13. II. 1978, Kano (TMDU) ; 1♀, Aiyura, 1,650 m, 14. II. 1978, Kano (TMDU).

**BIONOMICS.** Adult are attracted to decaying animal matter and human feces. Larvae breed in human feces. Larviparous.

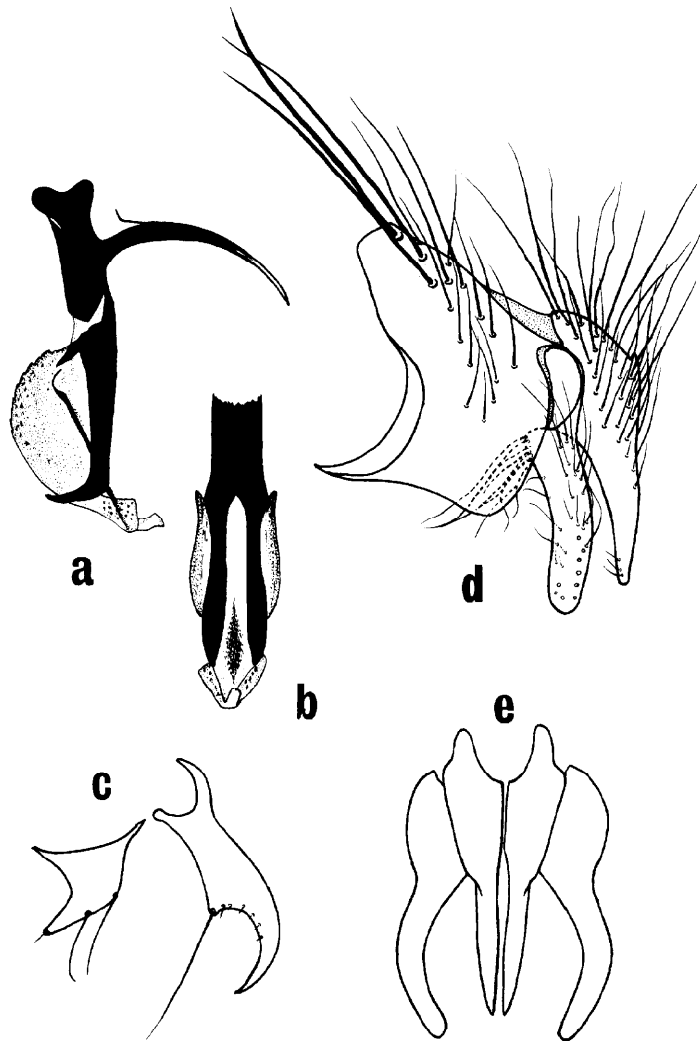
**DISTRIBUTION.** New Guinea (PNG).

### *Calliphora (Paracalliphora) kanoi*, new species Fig. 2

♂. *Head* : eyes bare, holoptic, narrowly separated on frons by a distance equal to width of ocellar triangle ; frons index 0.05-0.07 ; frontal stripe black, widened anteriorly and posteriorly, not obliterated at narrowest point ; frontalia dull yellowish-gray to gray-dusted, darkened toward vertex, with fine, rather long black setulae anteriorly, provided with about 10 pairs of *ori* ; face blackish, slightly gray-dusted, without median carina ; parafacialia yellowish-gray dusted, with rather long, fine black setulae above ; facialia yellowish brown, with black setulae on lower 1/2 from vibrissae to antennal bases ; medianae and vibrissaria reddish brown, bare ; vibrissae strongly developed ; genae and postgenae orange, yellowish-gray to golden-dusted, genae are clothed with black hairs except for yellowish some along peristomal margins ; postgenae entirely clothed with yellow hairs ; occipital dilatation behind upper corner of genae black, yellowish-gray dusted, clothed with yellow hairs ; occiput black, dull yellowish-gray dusted, clothed with yellow hairs except for a row of postorbital bristles ; epistome distinctly projecting forward, fuscous brown ; 3rd antennal segment largely blackish except for ventral surface of basal portion and joint of 2nd and 3rd segment reddish, slightly more than 3.5 x as long as 2nd ; 2nd segment fuscous brown ; arista black, long-plumose on basal 2/3 ; palpi light brown. *Thorax* : black, with bluish tinge, entirely with thin covering of white dusting, without any remarkable marking on dorsum ; scutellum, humeri and postalar calli concolorous with scutum ; prosternum blackish haired ; propleura with yellowish brown hairs, other pleural sclerites covered with black hairs ; hypopleural bristles black ; pleurotergite with patch of black setulae ; supraspiracular convexity pubescent, without setulose hairs ; postalar declivity with tuft of blackish hairs on central portion ; suprasquamal ridge with anterior parasquamal tuft of more than 10 fine black hairs ; tympanic tuft not developed, only a few black hairs are present ; mesothoracic spiracle black, metathoracic one blackish. Chaetotaxy ; **ac** 2+3, **dc** 2-3+3, **ia** 0+2, **h** 2-4, **ph** 3, **prs** 1, **sa**



3, +2 fine interstitials, pa 2, st 2+1, sc 3+1, pp 2-3, pst 2. **Wings**: hyaline, slightly infuscated at base; veins blackish; epaulet and basicosta black; subcostal sclerite fuscous black, with blackish brown pubescence; node of 2nd and 3rd longitudinal veins with several black setulae above and below, the setulose hairs are extended to 1/2 way to r-m cross vein above; 4th longitudinal vein bent with a right angle, but the corner is rounded, section of the 4th vein from bend to wing edge is inflexed; squamae entirely blackish brown, thoracic one is lobulated, almost entirely covered with fine long black hairs on upper surface. Halteres blackish. **Legs**: black, with black hairs; front tibia with 1 *p* and 3-5 short *ad*; mid tibia with 2-3 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 2-3 *ad*, 2 *pd* and 2 *av*. **Abdomen**: short oval, entirely dark blue, metallic, without pruinosity, blackish haired, the hairs on sternites are rather long and fine; tergites 1+2 and 3 with several lateral marginal bristles;



**Fig. 2.** *Calliphora kanoi* sp. nov., male hypopygium: a, aedeagus, lateral view; b, aedeagus without basal portion, posterior view; c, anterior and posterior parameres, lateral view; d, epandrium, cercus and parolobus, lateral view; e, cerci and paralobi, caudal view.

tergite 4 with complete row of erect marginals ; tergite 5 with erect fine bristles on disc and hind margin. Hypopygium normal in size, ♂ genitalia as shown in Fig. 2.

♀. **Head** : eyes separated at vertex by a distance equal to 0.32-0.33 of head width ; frontal stripe black, slightly narrowed posteriorly, slightly more than 2 **X** the width of 1 of parafrontalia just in front of anterior ocellus ; parafrontalia dull golden-dusted, darkened toward vertex, rather densely setulose above, provided with ca 8 pairs of **ori** ; **ors** 2 + 1 ; **oc** developed ; **acoc** absent ; **ov** and **iv** well developed ; **poc** parallel or divergent ; **occ** 1. **Legs** : hind tibia with 3 **ad** and 3 **pd**. **Abdomen** : dark blue, sometimes with copper, green or purple tinges; tergite 4 without complete row of marginal bristles, only lateral marginals are developed. Ovipositor of moderate length. Otherwise same as for ♂.

Length : 7.0-9.5mm.

**Holotype** , NEW GUINEA (PNG) : Mt. Ialibu-Mt. Giluwe, 2,000 m, 2. II. 1978, Kano (TMDU). **Paratypes** : NEW GUINEA (PNG) : 3 ♀, same data as holotype ; 1 ♂, Myola 2, forest, 2,080-2,200 m, Oro Prov., 1. V. 1984, Ismay (DPI) ; 1 ♀, Mt. Giluwe, 2,700 m, S. H. Dist., 11. VIII. 1982, Ismay (DPI) ; 1 ♀, Tambul, 2,200 m, W. H. Dist., 12. VIII. 1982, Ismay (DPI) ; 7 ♂ 5 ♀, Murmur Pass, 2,760 m, W. H. Dist., 20. X. 1981, Ismay (DPI) ; 1 ♀, Mt. Yule, C. Dist., 10,800 ft, 28. VIII. 1963, Szent-Ivany (DPI) ; 1 ♂ 29, Myiola, N. Prov., 2,200 m, 2. XI. 1984, Roberts (DPI) ; 1 ♂, Kakaitomba, 2,500 m, 26 km W of Mt. Hagen, W. H. Dist., 10. VIII. 1982, Shinonaga (TMDU) ; 170 69 ♀, Daulo Pass, Goroka, 2,300 m, 14. VIII. 1982, Shinonaga (TMDU).

The specific name is dedicated to Prof. Dr. R. Kano, chief of the project, who collected this interesting fly from the upper mountain in Papua New Guinea during his survey trip.

**TYPE DEPOSITORY.** Holotype in Bishop Museum ; paratypes in DPI, FRS, BMNH, KU, National Science Museum, Tokyo (NSMT).

**BIONOMICS.** Adults are attracted to decaying meat in native forests. Larviparous.

**DISTRIBUTION.** New Guinea (PNG).

### Genus *Tainanina* Villeneuve

*Tainanina* Villeneuve, 1926, Bull. Ann. Soc. Ent. Belge 66 : 217. Type-species : *T. grisella* Villeneuve, 1926 (= *T. pilisquama* (Sen.-White, 1925)).

### KEY TO THE SPECIES OF *Tainanina*

1. External **ph** usually developed ; presutural **dc** 2-4 ; hairs on thoracic squama usually yellow ; squamae and bases of wings yellowish ; larger species, more than 6.5 mm in length ..... *T. javanica* Kurahashi
- External **ph** absent ; presutural **dc** usually 2 ; hairs on thoracic squama fuscous brown ; wings hyaline ; smaller species, less than 6.5mm in length ..... *T. sarcophagoides* (Malloch)

### *Tainanina javanica* Kurahashi

*Tainanina javanica* Kurahashi, 1978, Pac. Insects 18 : 6. — Inder-Singh et al., 1979, Bull. Tokyo Med. Dent. Univ. 26 : 10.

Length : 6.5-8.5 mm.

**SPECIMENS EXAMINED.** NEW GUINEA (IRIAN JAYA : INDONESIA) : 1 ♀, Wisselmeren, Enarotadi, 1850 m, 12. VII. -4. VIII. 1962, Sedlacek (Bishop).

BIONOMICS. Nothing is known. The type materials were collected in tea plantation along the margin of native rain forest.

DISTRIBUTION. Malay (Inder Singh et al., 1979), Java and New Guinea (Irian Jaya).

### **Tainanina sarcophagoides** (Malloch)

*Calliphora sarcophagoides* Malloch, 1931, Ann. Mag. Nat. Hist. (10) 7 : 192.

**Tainanina sarcophagoides** : Sen.-White et al., 1940, Fauna Brit. India, Dipt. 6: 110. -James, 1966, Ent. Meddel. 34 : 466. —Kurahashi, 1978, Pac. Insects 18 : 4. —Tumrasvin et al., 1979, Bull. Tokyo Med. Dent. Univ. 26 : 248.

Length : 3.0-6.5 mm.

SPECIMENS EXAMINED. NEW GUINEA (IRIAN JAYA: INDONESIA) : 2♂, Wamena, 1,500-1,700 m, 10-25. II. 1960, Maa (Bishop) ; 1♂, Wisselmeren, Enarotadi, 1850, 12. VII.-4. VIII. 1962, Sedlacek (Bishop). NEW GUINEA (PNG): 1♂, Swart Val., Karubaka, 1,550 m, 8. XI. 1958, Gressitt (Bishop) ; 2♂ 1♀, Wau, Morobe Prov., 980-1250 m, 14. VIII. 1964, 4. V. 1965, 18. X. 1965, Sedlacek (Bishop) ; 1♂, Hospital Creek, 1,230 m, Wau, 26.VI.1965, Sedlacek (Bishop). NEW IRELAND : 2♂, Namatanai, 21-23. I. 1974, Shinonaga (TMDU).

BIONOMICS. Nothing is known.

DISTRIBUTION. Taiwan, Philippines, Vietnam, Thailand, Borneo, Malay, Lombok, New Guinea, Bismarck Arch. and Solomon Is.

### Genus **Polleniopsis** Townsend

**Polleniopsis** Townsend, 1917. Rec. Ind. Mus. 13 : 201. Type-species : **Polleniopsis pilosa** Townsend, 1917.

#### KEY TO THE SPECIES OF *Polleniopsis*

1. Presutural *ia* present ; abdomen black, densely covered with yellowish gray or golden dusting, strongly tessellated ; legs black ; facial carina well developed ; external *ph* present ..... **P. toxopei** (Sen.-White)
- Presutural *ia* absent ..... 2
2. External *ph* present ; abdomen bluish green, densely pruinose ; legs black ; posterior part of genae black ..... **P. jamesi** Kurahashi
- External *ph* absent ; abdomen tawny, sometimes semitransparent ; genae yellow ..... **P. fulviventris** Kurahashi

### **Polleniopsis toxopei** (Sen.-White)

*Paratricyclea toxopei* Sen.-White, 1926, Rec. Ind. Mus. 28 : 135.

*Pollenia toxopei* : Sen.-White et al., 1940, Fa. Brit. India, Dipt. 6 : 122.

*Polleniopsis toxopei* : Kurahashi, 1972, Pac. Insects 14 : 710.

Length : 5.0-9.5 mm.

SPECIMENS EXAMINED. NEW GUINEA (IRIAN JAYA: INDONESIA) : 1♂, Waris,

S of Hollandia, 450-500 m, 24-31. VIII. 1959, Maa (Bishop). NEW GUINEA (PNG) : 2 ♂, Mt. Gahavisuka, 6,500 ft, 23. VI. 1985, Roberts (FRS) ; 9 ♂ 5 ♀, Wau, 1,200 m, Morobe Prov., 20-26. V. 1962, 5-17. I. 1974, 30. I-2. II. 1985, J. Sedlacek, Shinonaga & Kurahashi (Bishop, TMDU & KU) ; 1 ♂ 1 ♀, Botanical Garden, Lae, 15. II. 1978, 30. I. 1978, Kano (TMDU) ; 1 ♂ 1 ♀, Lake Kutubu, S. Highland, 1,000 m, 6-9. II. 1978, Kano (TMDU) ; 1 ♂, Brown River, Port Moresby, 13-14. I. 1978, Kano (TMDU) ; 7 ♂ 16 ♀, Margarima Farm, S. Highland, 2,000 m, 5. II. 1978, Kano (TMDU) ; 1 ♂, Kandan, 1. I. 1960, Brandt (Bishop) ; 1 ♀, Simbai, 1,600-1,800 m, N. E. New Guinea, ? X. 1968, Krauss (Bishop). NEW BRITAIN : 20 3 ♀, Keravat, Rabaul, 25-27. I. 1974, Kano & Shinonaga (TMDU). NEW IRELAND : 2 ♂ 1 ♀, Namatanai, 21-23. I. 1974, Shinonaga (TMDU).

BIONOMICS. Nothing is known.

DISTRIBUTION. Malay, Borneo, Sumatra, Java, Buru I., New Guinea, Bismarck Arch., Solomon Is. and Admiralty Is.

### **Polleniopsis jamesi** Kurahashi

*Polleniopsis jamesi* Kurahashi, 1972, Pac. Insects 14 : 714. -Kurahashi, 1980, Pac. Insects 22 : 171.

Length : 8.5-11.0 mm.

SPECIMENS EXAMINED. NEW GUINEA (PNG) : 1 ♂, K. Rehder Ptn., Kainantu, 3. VI. 1960, ? (DPI) ; 1 ♀, Aiyura, E. H. Prov., 5,400 ft, 10. VI. 1958, fruit fly trap, Barrett (DPI) ; 2 ♀, Mt. Gahavisuka, 6,500 ft., 22. VII. 1983, Roberts (FRS).

BIONOMICS. Nothing is known.

DISTRIBUTION. New Guinea (PNG).

### **Polleniopsis fulviventris** Kurahashi

*Polleniopsis fulviventris* Kurahashi, 1972, Pac. Insects 14 : 716.

Length : 6.0-9.0 mm.

SPECIMENS EXAMINED. No additional material to the type series.

BIONOMICS. Nothing is known.

DISTRIBUTION. New Guinea (Irian Jaya & PNG).

### Genus **Melinda** Rob.-Desvoidy

*Melinda* Rob.-Desvoidy, 1830, Ess. Myod. : 439. Type-species : *Musca cognata* Meigen, 1910.

#### KEY TO THE SPECIES OF **Melinda**

1. Third antennal segment bright orange ; wings infuscated ; tergite 3 with several erect marginal bristles on lateral sides ..... *M. ruficornis* sp. nov.
- Third antennal segment fuscous black ; wings largely yellowish brown on basal 2/3 ; tergite 3 with row of erect marginal bristles ..... *M. flavipennis* sp. nov.

The following two new species seem to be an aberrant of the genus *Melinda* because they have a bare prosternum. The hairy propleura and prosternum are characteristic of the subfamily Calliphorinae to which the genus belongs. Besides this aberration, the general morphology of these **two New Guinea** species quite agrees with that of *Melinda*.

*Melinda ru f icornis*, new species

♀. **Head** : eyes hairy, dichoptic, separated at vertex by a distance equal to 0.25 of head width ; frontal stripe black, slightly narrowed posteriorly, 2.0  $\times$  the width of 1 of parafrontalia just in front of anterior ocellus, with several pairs of interfrontal bristly hairs ; parafrontalia dark gray-dusted, with black setulae, provided with ca 4 pairs of strong *ori*; *ors* **3**, very strong, anterior one is proclinate, posterior two are directed externally ; *oc* developed ; *acoc* absent ; *poc* divergent ; *ov* and *iv* strong ; *occ* 1 strong ; parafacialia dark gray-dusted, with fine black setulae above ; facialia black, slightly gray-dusted, setulose on more than lower 1/2 ; epistome and face black, submetallic ; face without median carina ; medianae narrow, black, bare ; vibrissaria and genae black, submetallic, clothed with black hairs ; vibrissae strong ; postgenae and occiput concolorous with genae ; occiput with pale hairs on central part ; 3rd antennal segment reddish orange, slightly more than 2  $\times$  as long as 2nd ; 1st and 2nd segments black, submetallic ; arista submetallic black, long plumose on basal 2/3 ; palpi fuscous, but reddish brown on apical 1/3. **Thorax** : black, submetallic, gray-dusted anteriorly and laterally, one broad median, two fine submedian and one lateral broad longitudinal stripes are visible on prescutum ; median broad stripe not interrupted by transverse suture, but the other external three stripes interrupted by transverse suture or dusting on scutum ; scutellum reddish apically, but largely concolorous with dorsum ; humeri and postalar calli concolorous with thoracic dorsum, but slightly reddish on lateral sides of postalar calli ; propleura blackish setulose ; other pleural hairs black ; prosternum bare ; supraspiracular convexity pubescent, without erect hairs ; mesothoracic and metathoracic spiracles blackish ; pleurotergite with a patch of black setulae ; postalar declivity with a few black setulae in central circle ; a few of tympanic and anterior parasquamal hairs present. Chaetotaxy ; *ac* 2 + 3, *dc* 3 + 3, *ia* **1** + 3, *h* 3, *ph* 2, *prs* 1, *sa* 3, *pa* 2-3, *st* 2 + **1**, *sc* 4 + 2, 1 pair of fine additional discals developes between apical marginals and discals, *pp* and *pst* strongly developed. Wings : entirely infuscated ; veins blackish brown ; epaulet black ; basicosta blackish brown ; subcostal sclerite blackish brown, pubescent ; node of 2nd and 3rd longitudinal veins with several black setulae above and below ; 4th longitudinal vein bent with obtuse angle ; squamae blackish brown, thoracic one is lobulated, bare on upper surface. Halteres yellowish brown. **Legs** : black except for mid and hind tibiae slightly reddish, black haired ; front tibia with 1-2 *p* and a row of short *ad* ; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v* ; hind tibia with 2 *ad*, 2 *pd* and 2 *av*, besides these incomplete rows of short *ad* and *pd* are also present, apical *ad* is well developed. **Abdomen** : submetallic black, reddish on venter of tergite 1+2, lateral sides of tergite 3 and posterior margin of tergite 5, silver-gray dusted, weakly tessellated, clothed with black hairs and strong bristles ; tergite **1** + 2 submetallic black, with a group of long hairs on lateral sides of abdomen and a few strong lateral marginal bristles ; tergite 3 with erect lateral marginal bristles ; tergite 4 with erect strong marginal bristles ; tergite 5 with erect marginal bristles and discals. Ovipositor elongate, with corneous 7th tergite typical of the genus *Melinda*.

♂. Unknown.

Length : 5.5 mm.

Holotype ♀, NEW GUINEA (PNG) : Mt. Hagen, 2,910 m, 12. II. 1978, Kano (TMDU).

**TYPE DEPOSITORY.** Holotype in Bishop Museum.

**BIONOMICS.** Unknown.

**DISTRIBUTION.** New Guinea (PNG).

*Melinda flavipennis*, new species Fig. 3

♂. **Head** : eyes bare, holoptic, separated at narrowest point by less than the width of ocellar triangle ; frons index 0.04 ; frontal stripe black widened anteriorly and posteriorly, reduced to a fine line at narrowest point ; parafrontalia narrow, silver-gray, darkened toward vertex, with black setulae anteriorly, with ca 10 pairs of *ori* and fine some interstitials ; parafacialia silver-gray dusted, with fine black setulae above ; facialia black, slightly silver-gray dusted, setulose on lower 1/3 ; epistome and face black, slightly gray-dusted ; face without median carina ; medianae blackish brown ; vibrissaria and genae black, gray-dusted, clothed with black hairs ; vibrissae well developed ; postgenae and occiput concolorous with genae, with black hairs ; antennae blackish ; 3rd antennal segment, gray pubescent in a certain incident of light, slightly more than 2 x as long as 2nd ; arista blackish brown, long plumose on basal 2/3 ; palpi black, with black hairs. **Thorax** : black, covered with silver gray dusting, with dark stripes and spots more or less distinct when viewed from behind ; prescutum with two fine submedian stripes and broad triangular lateral spots, trace of median stripe is present on posterior 1/2 ; scutum with three rather broad median and lateral stripes, trace of

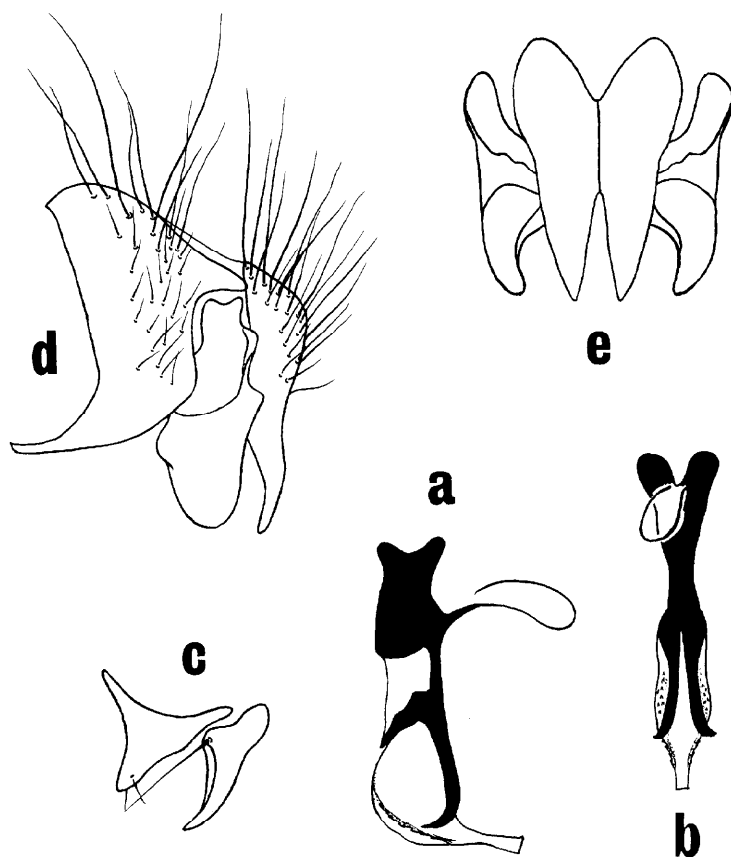


Fig. 3. *Melinda flavipennis* sp. nov., male hypopygium : a, aedeagus, lateral view ; b, aedeagus, posterior view ; c, anterior and posterior parameres, lateral view ; d, epandrium, cercus and parolobus, lateral view ; e, cerci and paralobi, caudal view.

submedian stripes are present on posterior 1/2; scutellum, humeri and postalar calli concolorous with dorsum, postalar calli are more or less reddish along margins; propleura with black hairs, other pleural hairs are also black; prosternum bare; supraspiracular convexity pubescent, without erect hairs; mesothoracic and metathoracic spiracles black; pleurotergite with a patch of black setulae; postalar declivity with tuft of black hairs in central circle; a few black tympanic hairs present; no anterior parasquamal hairs present. Chaetotaxy; *ac* 2+3, *dc* 3+3, *ia* 1+3, *h* 3, *ph* 3, *prs* 1, *sa* 3, *pa* 2, *st* 2+1, lower 1 of anterior *st* is usually fine, *sc* 4+2, several fine additional discals are developed between apical marginals and discals, *pp* and *pst* developed. Wings: hyaline, rather strongly tinged with yellowish pigment on basal 2/3, slightly infuscated on apical 1/3 and posterior margin; veins yellow; epaulet and basicosta black; subcostal sclerite brown, pubescent; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 4th longitudinal vein bent with a gentle curve; squamae yellowish brown, thoracic one is lobulated, without hairs on upper surface. Halteres yellowish brown. *Legs*: black, black haired; front tibia with 1 *p* and a row of *ad* on basal 2/3, 1 *ad* on apical 2/3 is relatively strong; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 2 *ad*, 2 *pd* and 1 *av*. *Abdomen*: black, with brassy tinge; gray-dusted, weakly tessellated, clothed with black hairs; tergite 1+2 black, rather densely covered with black hairs, with strong lateral marginal bristles, besides these some additional bristles are developed on lateral sides of abdomen; tergite 3 black, brassy, with thin covering of brownish dusting, with row of lateral marginal bristles, without median pair of marginals; tergites 4-5 black, densely gray-dusted, with weak tessellation, with complete row of erect marginal bristles, row of erect discal bristles is also developed on lateral sides. Hypopygium smaller in size, ♂ genitalia is shown in Fig. 3.

♀. Unknown.

Length: 7.5 mm.

Holotype ♂, NEW IRELAND: Namatanai, 21-23. I. 1974, Kano (TMDU).

Paratype: NEW IRELAND: 1 ♂, same data as holotype.

TYPE DEPOSITORY. Holotype in Bishop Museum; paratype in author's collection in NSMT.

BIONOMICS. Unknown.

DISTRIBUTION. New Ireland.

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